Optimizing a Periodized Diet and Supplementation for Sprinters and Jumpers: Case Studies and Practical Application

By Justin Fawley

Ever since Tudor Bompa and Leo Matveyev organized Hans Selye’s stress-response models into periodization systems, coaches have argued about how to best set up the months of an athlete’s training. The best collegiate athletes have multiple coaches and therapists working together to create meticulously planned year-round training schedules to draw out their best performance at the right time. However, very few athletic departments have a nutritionist available to meet directly with their athletes. In a study published in 2012, nutritional knowledge of those involved with athletics was as follows: “Adequate knowledge was found in 35.9% of coaches, 71.4% of (athletic trainers), 83.1% of (strength and conditioning specialists), and only 9% of athletes. The most used nutrition resources for coaches, ATs, and SCSs were registered dietitians” (Torres-McGehee).

Due to the lack of nutritional guidance, athletes often eat healthy, according to recommended daily allowances for the general population, and take the popularly recommended supplements for enhancing performances. According to Rick Brunner, many supplements are haphazardly researched, and then programmed into daily routines, without the knowledge of why the supplement should be used: “Many supplements are poorly researched and formulated, contain what may seem to be safe nutrients (like vitamins C and E, for example) that can in fact be disadaptive, contain non-optimal doses (too little or too much), etc” (Brunner). Brunner further states that athletes should take the time to look at the results of taking certain supplements in conjunction with the goals of their training and compare to make sure the stimuli compliment each other rather than detract from each other.

If the supplement actually contributes to some functional-stress effect, such as amplifying the influence of training so that you have a boost in adaptive response (i.e., more muscle proteins, more mitochondria, etc.) in post-exercise recovery, a pre-workout supplement might be useful. The key is you need to truly get measurable results from training. I’m not sure many pre-workout supplements are functionally useful, and they may in fact deter from the optimal training adaptations from training.

Many nutrients consumed prior to or during training can actually reduce the benefits of training

We know that the stress of training creates post-exercise signaling to improve sport results and that many nutrients consumed prior to or during training actually reduce the benefits of training (such as antioxidants like vitamins C and E, and many vitamins and minerals in general) in blunting the needed stress signal. Coaches and athletes would be wise to validate the usefulness of any pre-workout supplement. For example, is there any published science on the ingredients or formula as functional performance enhancers, resulting in an amplification of training to improve athletic ability? (Brunner)

Rather than viewing food and supplements as necessary for life, research and case-studies show that both coaches and athletes at high levels would be better served to have a holistic view of nutrition. Seeing nutrition as an additional stimulus either competing with, or...
complimenting the day-to-day training. Through proper nutrition management athletes should be able to get the most out of each training session, and each training cycle. Doing so requires an understanding of the stimulus that each nutritional choice provides.

Research in Periodized Nutrition

Research into periodized nutrition is a relatively small body, but is growing every year. Most studies focus on the cycling of carbs throughout the athletes training schedule. Since these studies focus on carbohydrate energy availability, a significant amount of research is focused on endurance athletes. One study found significant short term cycling between training on low carb availability or training with a high carbohydrate availability, and sleeping on carbohydrate restricted diets. This study concluded that “Short-term periodization of dietary CHO availability around selected training sessions promoted significant improvements in submaximal cycling economy, as well as supra-maximal cycling capacity and 10 km running time in trained endurance athletes” (Marquet).

Another study published in 2013, sought to provide practical recommendations for tennis players, although the study did not deal with with sprinters and jumpers, it gives a great idea of the energy demands of high levels of sport. The researchers found that tennis players expend a considerable amount of energy, over 3,000 kcals in a single 1.5 hour session (Ranchordas). This study looked into how athletes cycle macronutrients thought the year, and gave general recommendations for macronutrient intake. The study concluded by noting the lack of research done in the field towards periodizing nutrition. This study has practical applications, that will be discussed in section III, when dealing with extremely intense bouts of exercise resulting in high caloric needs, as seen in the competition phase of training.

One of the fields most prominent researchers, Asker Jeukendrup, recently published a review paper in 2017 detailing many of the methods used by professional athletes. The review drove the point home that the most common methods of periodization are cycling carbs. The main conclusions from the review were that “Many pragmatic questions remain unanswered...that may have great practical relevance and should be the focus of future research” (Jeukendrup). The paper also reinforces the point that no single diet cycling method works universally for athletes, and that the training of the individual should dictate the nutritional needs and strategies of each athlete.

Recommendations

During no cycle should athletes use significant amounts of supplements. The biggest focus should be on meeting nutritional needs through whole food sources. Additionally athletes can supplement with ergogenic aids, provided that they coincide with the goals of the cycle, and do not directly counter the training effect the cycle is striving for.

The most common recommendation from both research and case studies are to use the first phase of training, or the off-season, to manage the athlete’s weight and inflammation, and to experiment with different fluid and food intake strategies, including timing, and amount of intake over the course of a day (Houtkooper). The off-season should be a time of exploratory experimentation, as training will not be as adversely affected as it would be in the competition phase.

Christian Taylor, an Olympic gold medalist in the triple jump conducted this experimentation post-Olympics in 2012 and it kept him from retirement (Rouse). Through it he was able to reduce his carbohydrate intake, consequently reducing inflammation post-workouts, and saving his career in the process (a great primer on inflammatory vs. anti-inflammatory foods can be found here). He also was able to experiment with protein and fat sources, and cycle through various sources depending on the demands of the following session, stating:

> With dinner, it’s very important to keep in mind whatever the session I have the next day. If I were having a lot of (fast) running the next day then I would usually have fish or chicken (less inflammatory). Something that could break down a little quicker, versus if I know that I have a slower tempo day or something that’s not so intense. Then I would have some kind of steak or lamb again (relatively more inflammatory), because I don’t need to feel super light the next day. (Rouse)

Once the athlete has experimented with their daily intake, they will be more conscious of what they need nutritionally, and when. One of
the best ways for an athlete unsure of how to nutritionally experiment would be to do one of the many whole food detoxes, such as the Whole30. From that starting point, they will have a greater understanding of how food affects their body, and what foods they are able to digest well.

- A good starting point to nutritionally experiment for beginners is a whole food detox

During the competition phase the athlete's main focus should be on simulating competition nutritional plans, and keeping inflammation low. These strategies will make the athlete feel comfortable and recovered, making them ready to move into a more intense series of workouts and competitions. With the intensity demanded by these training cycles, it is a good idea for the athlete to be more rigorous in their meal planning, and use what they learned in the pre-competition experimentation cycle to keep their body feeling good from workout to workout.

- It is also a good idea for the coach to create workouts that simulate the intensity of competition day, so that the athletes can test out their nutrition plans, and be sure that their body will respond well to the more intense demands. This is due to the gut responding differently to higher intensity exercise (Seebohar). As seen in the study by Ranchordas, caloric need during intensive exercise and recovery days can undulate greatly. The athlete should also pay attention to this phase’s wide training load variation and vary their caloric intake to match needs as it is easy to overeat during the less intensive bouts of this phase.

During the transition phase, since activity is low, it is recommended that athletes cycle off of any supplements they are currently taking, and they drop the caloric intake greatly. This is a cycle of rest and rejuvenation, so the athlete should focus on maintaining adequate fluid balance, and increasing protein and fat intake while dropping carbohydrate intake. The reasoning for this is that proteins and fats are significantly more satiating, and give energy for longer periods of time.

Generally athletes should be eating significant amounts of whole food sources and abstaining from heavily processed foods, no matter what cycle they are in. Prioritizing whole fats, legumes, dark leafy greens, berries, olive oils, avocado, and small amounts of coffee and red wine will help an athlete remain healthy and happy. On the other hand; if an athlete is consistently consuming fried food, processed meats, large amounts of alcohol, and high sugar-content foods and drinks, even the most meticulously planned training will be derailed, no matter how much recovery the athlete does.

Conclusion

Collegiate sprinters and jumpers spend significant amounts of their year training to be the most explosive that they possibly can be. This requires more than being present at practices, and demands that coaches educate athletes on their nutritional needs. A well-rounded nutrition plan should ensure that the athlete can complete each training session with enough fuel in the tank, and receive the largest training effect from it. Understanding this, athletes should be careful not to haphazardly use supplements without knowledge of what its effects on bodily processes are (Houtkooper).
Athletes should know how individual foods affect their own bodies. Once they understand how foods affect them personally they should work together with a sport coach, and strength and conditioning coach to create a nutrition plan. By following these strategies, and others found in Houtkooper's 2007 study, in the section "Summary of nutritional guidelines for combined events athletes", athletes can set their bodies up for a successful season of competing at the highest level.

About Justin Fawley

"Justin Fawley is a Graduate Assistant Coach for the Michigan Tech Track and Field Team, focusing on Sprints/Jumps and Multis. A native of Akron, Ohio, Fawley attended Hillsdale College and was a standout track and field athlete during his collegiate career as a multi-enerter."

Bibliography


Leave a Reply

Your email address will not be published. Required fields are marked *
Subscribe to Podcast

- on Apple Podcasts
- on Android
- by Email
- on Google Podcasts
- on Stitcher
- on Tuneln
- on Spotify
Unleash your athletic potential with our free training guides which include over 35 PAGES of knowledge!

Best Email *

Name *

Submit
Most athletes periodize to one degree or another. Usually the goal of periodization is to develop fitness towards specific competition periods. Some will even target a single competition and train an entire year exclusively for that (e.g. Lance Armstrong trained towards the Tour De France as his only major competition). Obviously competitive bodybuilders will periodize towards their competition but I think that even recreational bodybuilders (guys who just want to be big and ripped or just bit) can benefit from structuring their training as well. That structuring, regardless of the specific type... Studies done years ago found that athletes moving into low rep ranges (for maximal strength) frequently lost muscle size. Plyometric jumps from the box and on landing can be made from either one of two feet, with landings alternating left and right (as would be the case with..). Verkhoshansky's methodologies were based on considerable research and practical application. Related: recommended plans for you. Due to the impact involved in plyometrics his methods became known as the ‘shock' method. Verkhoshansky realised that muscle loadings and crucially outputs were significantly heightened by the use of the stretch/reflex capacity of muscles. This involves an eccentric to concentric pair of muscular actions. These occur rapidly when a jump is performed after a landing from another jump (and when running). How can we optimise these effects, short term and long term? No one clearly defined, however, what methods are part of this periodized nutrition approach and people have interpreted the terms in different ways. This is what I tried to address in a recently published review in Sports Medicine. I defined the concept of periodized nutrition as: the strategic combined use of exercise training and nutrition, or nutrition only, with the overall aim to obtain adaptations that support exercise performance. This is a mouthful, but it stresses that nutrition with or without exercise can affect the body in ways that will ultimately affect performance. LCHF diets and performance in elite athletes. December 26, 2016. Ketogenic diets for athletes. December 1, 2016. Foodfight: high fat versus high carb.
Creatine supplementation may only allow for the maintenance of maximal sprint speed for a fraction of a second longer than normal, or the ability to complete 1 more rep when weight training, but when these gains are compounded over multiple training sessions, the results will speak for themselves. Another way creatine can improve your athletic performance is by allowing more CP to be available for recovery between sets or bouts of a specific exercise or activity. Optimizing a Periodized Diet and Supplementation for Sprinters and Jumpers: Case Studies and Practical Application. June 1, 2018. Magnesium Supplements: Does Chelation Really Matter? Sprinters routinely use a periodized program containing resistance training, plyometrics and sprint work in order to improve performance.10, 11 Perhaps due to inherent difficulties in. The longitudinal nature of this study reveals new insights into how the performance and technique outcomes are associated with the periodized training program in elite sprinters. 268. Although the athletes were part of the same training group with the same coach, each had an in elite sprinters and have quantified both performance and step characteristics. 300. 301. Sprinters: tailor your diet for maximum performance on race day with this sprinters diet from STACK Expert Kait Fortunato. Sprinters aim to increase muscle mass and power for their explosive event, so protein is clearly important. However, if carbohydrate and fat intake are insufficient, both energy levels and muscle mass will suffer. Remember, carbohydrates and protein work together to build muscle. Creatine supplementation may increase muscle mass, but weight gain is possible. Research has shown that creatine supplementation for sprinters results in either a slight performance enhancement or no change in sprint velocity. If you're going to use creatine, it might make more sense to do it during your training, not on race day. Race Day Sprinter's Diet.